ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)

DATE: February 2000

BUDGET ACTIVITY: **2 - Applied Research**

PE NUMBER AND TITLE: **0602622A Chemical, Smoke and Equipment Defeating Technology**

COST (*In Thousands*)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	4660	4953	3530	3550	3580	3856	3879	Continuing	Continuing
A556 Optical Microscopy	0	981	0	0	0	0	0	0	0
A552 Smoke/Novel Effects Munitions	4660	3972	3530	3550	3580	3856	3879	Continuing	Continuing

A. Mission Description and Justification: This program element researches and matures enhanced smoke and obscurant technologies to increase personnel/platform survivability, and solve critical light force needs to defeat enemy targets (i.e., non-lethal and flame/incendiary devices). The program element provides applied research in technologies to counter enemy weapon systems and to provide the ability to degrade enemy capability. Improved multispectral smokes/obscurants are explored to enhance survivability by providing effective, affordable, and efficient screening of deployed forces from threat force surveillance sensors and effective defeat of target acquisition devices, missile guidance, and directed energy weapons, all of which can operate anywhere from the visible through the microwave portion of the electromagnetic spectrum. These systems will be designed to be safe and environmentally acceptable. Flame and incendiary payloads will be developed to defeat a variety of targets ranging from personnel to bunkers and light armored vehicles. Work in this program element is consistent with the Army Science and Technology Master Plan (ASTMP) and the Army Modernization Plan. Efforts under this program element transition to Program Definition and Risk Reduction (PDRR), and Engineering and Manufacturing Development (EMD) programs. This program is managed by the U.S. Army Edgewood Chemical Biological Center, Aberdeen Proving Ground, MD.

B. Program Change Summary	FY 1999	FY 2000	FY 2001
Previous President's Budget (FY 2000/2001 PB)	5078	3996	4042
Appropriated Value	5116	4996	
Adjustments to Appropriated Value			
a. Congressional General Reductions	-38		
b. SBIR / STTR	-110		
c. Omnibus or Other Above Threshold Reductions			
d. Below Threshold Reprogramming	-288	-17	
e. Rescissions	-20	-26	
Adjustments to Budget Years Since FY 2000/2001 PB			-512
Current Budget Submit (FY 2001 PB)	4660	4953	3530

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PE NUMBER AND TITLE: 0602622A Chemical, Smoke and Equipment Defeating Technology

PROJECT: A556

COST (*In Thousands*)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
A556 Optical Microscopy	0	981	0	0	0	0	0	0	0

Mission Description and Justification: This one year Congressional special interest project is focused on evaluating soybean oil as a material for producing visible smoke. The project involves evaluation of material performance and its environmental properties.

FY 1999 Accomplishments: Project not funded in FY 1999.

FY 2000 Planned Program:

- 955 Characterize the key material properties, evaluate the performance, and determine the environmental effects of soybean oil as a visible smoke material.
- 26 Small Business Innovation Research / Small Business Technology Transfer Programs

Total 981

FY 2001 Planned Program: Project not funded in FY 2001.

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BUDGET ACTIVITY **2 - Applied Research**	PE NUMBER AND TITLE **0602622A Chemical, Smoke and Equipment Defeating Technology** PROJECT **A552**

COST (*In Thousands*)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
A552 Smoke/Novel Effects Munitions	4660	3972	3530	3550	3580	3856	3879	Continuing	Continuing

Mission Description and Justification: Project A552 provides applied research in technologies to counter enemy weapon systems and to provide the ability to degrade enemy capability. Improved multispectral smokes/obscurants are explored to enhance survivability by providing effective, affordable, and efficient screening of deployed forces from threat force surveillance sensors and effective defeat of target acquisition devices, missile guidance, and directed energy weapons, all of which can operate anywhere from the visible through the microwave portion of the electromagnetic spectrum. These systems will be designed to be safe and environmentally acceptable. Flame and incendiary payloads will be developed to defeat a variety of targets ranging from personnel to bunkers and light armored vehicles.

FY 1999 Accomplishments:

- 2292 - Completed design and adaptation of the Millimeter Wave (MMW) module on the M56 and M58 smoke generators; implemented cost and maintenance reduction measures. Produced first-ever results of millimeter wave obscurants versus a simulated millimeter wave fire control radar. Incorporated millimeter wave obscurant use into modern battle scenario using the Combined Arms and Support Task Force Evaluation Model (CASTFOREM) wargame. Demonstrated obscurant value-added in reduced loss exchange ratio.
  - Investigated vehicle smoke and obscurant acquisition and hit avoidance measures and concepts applicable to an integrated defense system for armored vehicles.
  - Investigated infrared screening material propellant dissemination in a smoke pot configuration.
- 2000 - Evaluated performance predictive capability for infrared (IR) materials.
  - Conducted initial assessment of various Distant Smoke delivery concepts.
  - Conducted initial smoke antimaterial feasibility assessment.
- 368 - Conducted a tech watch in flame, incendiary, antimateriel and riot control technologies. Surveyed marking materials and examined an antimateriel application.
  - Concluded thermite (aluminum and iron oxide pyrotectic reaction) scaling study.

Total 4660

FY 2000 Planned Program:

- 1584 - Conduct in depth field evaluations of the cloud produced vehicle protection obscurant technologies.
  - Apply propellant dissemination technologies for smoke pot configuration.
  - Support transition of the millimeter wave material and module to PM Smoke for Pre-Planned Product Improvement.
- 2303 - Investigate new high performance obscurants for munition applications and for reduced logistics burden; continue IR material performance characterization.

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BUDGET ACTIVITY 2 - Applied Research	PE NUMBER AND TITLE 0602622A Chemical, Smoke and Equipment Defeating Technology
	PROJECT A552

FY 2000 Planned Program: (Continued)

- Assess distant smoke delivery methods.
- Conduct assessment of methodologies and requirements analysis for Smoke/Obscurant simulation infrastructure.

•	85	- Small Business Innovation Research/ Small Business Technology Transfer Program.
Total	3972	

FY 2001 Planned Program:

•	1055	- Incorporate dissemination technology in Vehicle Smoke Protection Model and Cloud Density Visualization Utility Model. - Support smoke simulation in Combined Arms Tactical Trainer, High Level Architecture and Distributed Integration Simulation. - Evaluate foreign emissive and pyrotechnic IR and multispectral concepts. - Complete IR smokepot investigation. Investigate other smokepot dissemination techniques. Assess multi-spectral capabilities and configuration schemes.
•	2475	- Determine limits of performance for improved millimeter wave obscurants. - Investigate improved infrared screening candidates for reduced logistics burden. Complete IR material performance characterization. - Down-select Obscurant/target defeat technology for Distant Smoke system. Evaluate prototype delivery systems.
Total	3530	